

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :

Appl. No.10/625,149 : Confirm. No. 8274
H. Downman McCarty, II :
Brooke Schumm III :
Peter Popper, Applicants : Examiner: O. Flores Sanchez
Filed: July 23, 2003 : Group Art Unit 3724

**For: AN ANTI-SPALLING COMBINATION ON AN IMPACT TOOL
WITH AN IMPROVED HOLDING SYSTEM**

Honorable Commissioner of Patents and Trademarks
Mail Stop Patent Application, P.O. Box 1450
Alexandria, VA 22313-1450

CONTINUATION AND PRIORITY DATA

Continuation in part of PCT/US02/23448 and entry into the national stage of
PCT/US02/23448, continuation in part of U.S. provisional applications 60/307,198 filed
on July 23, 2001, and 60/356,804 filed on February 13, 2002

RESPONSE TO OFFICE COMMUNICATION OF JULY 5, 2007

Petition is made for a 2 month extension of time for the Response to the Office
Action pursuant to 37 C.F.R. 1.136.

Introduction and discussion of examiner interview

The examiner is thanked for his time in the examiner interview. The summary is
attached. A sample of the invention was presented to demonstrate the contrast of its
hardened cap versus Jeffery, U.S. Pat. 3,320,986, May 23, 1967. The Jeffery patent, in
entire contrast to the present art, contemplates, as shown in Figure 4, that the cap or head
on the chisel shaft is designed to be soft, and after being struck, to be flattened and to
mushroom. The specification states that the cap or head is to mushroom from the

dimensions of the head (element 24) shown in Figure 4 to “the partly domed shape of head indicated at 27 [in Figure 4].” See Jeffery ‘986 at col. 3, line 21 to col. 4, line 3.

The examiner and the applicants’ counsel discussed the distinction between Jeffery and the present invention of McCarty et al, and the applicant, as set forth in this Response, proposed narrowing the claim to encompass the material utilized in the present invention, which the examiner indicated would have to be reviewed further. Applicants believe that agreement was reached that the Applicant’s invention is not anticipated by Jeffery ‘986 under section 102.

At the interview, with respect Smith, U.S. Pat. 4,497,355, Feb. 5, 1985, the applicants pointed out that Smith is focused on a series of cutting guides to maintain a particular angle of the chisel and enable more rapid sharpening. The applicants and examiner agreed that the language “decreased” should be changed to less than.

Discussion

As pointed in the examiner interview, the primary distinction between Jeffery, U.S. Pat. 3,320,986, May 23, 1967, and the present invention is that Jeffery contemplated and welcomed deformation of his cap; in the present invention, very high modulus materials are contemplated which do not deform, and are deliberately designed not to deform. Deformation absorbs energy, and contrary to Jeffery, the intent of this invention is to transmit as much energy and force as possible to chisel shaft, while objectives of safety and ergonomics, and have no deformation. Reference is made to a published paper which tested the invention: Griffith M. et al, “Polymer Composite-Based Vibration and Noise Emission Controls for Hand-Struck Impact Tools,” Proceedings of the ASME 2007 International design Engineering Technical Conferences & Computers

and Information in Engineering Conference, Sept. 4-7, 2007 (DETC 2007-35699) (ASME 2007) (“Griffin” or the Griffin article”). That Griffin paper at page 5 discussed the impact resistance of the present invention: “This application requires materials of very high impact resistance that withstand repeated blows of several thousand pounds each,... in this application, a high modulus is needed to develop a high force under the chisel.” Griffith et al, page 5, column 1.

Jeffrey teaches away from this characteristic of high impact resistance. Jeffrey contemplates deformation (“said head being formed of a soft material so as to mushroom out when struck and form a dome-shaped head.”) (Jeffrey col.1, lines 49-53); (“it will be observed that after the head 24 has been struck a certain number of blows it will have flattened and mushroomed to form the partly domed shape of head indicated at 27.”) Jeffrey col. 3, line 27-col. 4 line 3). Thus, Jeffrey ‘986 teaches deformation, and teaches away from the conception of the present invention.

As described in the Griffith et al article, “[r]esults [of testing of the present invention] indicate a Minlon cap is capable of withstanding over 2000 dead-center impacts without failure, distortion, or wear.” Griffith at p. 6, col. 2.

The problem with mushrooming is a safety problem because mushrooming causes splintering of the cap and splinters can fly off when the cap is struck after mushrooming has occurred. The desired mushrooming in Jeffery ‘986 contemplates a taffy-like material that will deform to a desired shape; this is precisely the opposite of the present invention. Further, there is no end to the deformation of the Jeffery invention under repeated blows.

The Griffith article reference that “a number of simple hammer impact tests were conducted on a range of thermoplastics, including elastomers (Hytrel™ family), polyacetal (Delrin™), carbon fiber reinforced materials, polyesters, and nylons. Most materials failed readily after only a few blows.”

This predicted and observed failure of nylon described in the Griffith article is consistent with the objective of Jeffrey’s invention which is deformation and failure to a domed shape. As the Griffith article points out, ultimately nylon fails completely. Jeffery ‘986, in its preferred mode, proposed using a soft copper, and did not even suggest nylon as its preferred mode.

However, by contrast, this invention contemplated, as described by Griffith, that “Nylon’s modulus is relatively low compared to other materials, but it can be increased substantially by adding reinforcing material. DuPont[™] manufactures a number of reinforced nylon polymers within the Minlon™ family of products, as with most polymers, the modulus and impact resistance vary inversely with each other. We selected an intermediate level of both properties.”

By adding reinforcing material and selecting a high modulus with reasonable impact resistance, the inventors have achieved objectives, as set forth in the Griffith article, high durability, redistributed sound, and substantially decreased vibration. The conclusions in the Griffith article at page 8 set forth the accomplishment of the invention by the addition of a cap to a bare chisel. Moreover, as the conclusion’s final points referenced:

“*Performance of capped chisels is somewhat lower than bare chisels, However, this effect can be essentially eliminated by using a sharper chisel tip angle.

*Polymer capped chisels have several significant performance advantages: reduced operator discomfort due to hand-arm mechanical shock, reduced noise, and less danger from flying fragments.”

Further, as set forth in dependent claims such as 145 and 149, the combination of the selected nylon material reinforced with fiber or mineral with a decreased included angle, e.g., a more sharply or acutely tipped chisel, achieves virtually the same impact effectiveness as a bare chisel. See, Griffith et al, page 6, column 2. Deforming materials would not achieve such a result.

The Smith art, U.S. Pat. 4,497,355, Feb. 5, 1985, by its very terms states: the present invention entails a woodworking device in the form of a wood chisel or plane iron blade wherein the blade portion of such device is provided with grinding guides which an individual may use to assure that the cutting edge is sharpened squarely and that the angle of the beveled surface is properly angled. Smith '355 at col. 1, 55-61. Smith continues: “Further it is appreciated that the grinding angle guides 30 enable the beveled cutting surface of both devices to be maintained at the appropriate angle. Smith '355 col. 4, lines 16-18. Previously Smith stated that “Generally the beveled cutting surface 20 should be maintained at approximately a 65 degree angle. As viewed in Fig. 2, this would mean a 65 degree angle with respect to a horizontal reference line....” Smith '355 col. 3 at lines 19-24. The purpose of Smith’s guidelines was to furnish a guide for repeated sharpening that was simple and easy to follow: “such that during the sharpening

process the grinding angle guides can be utilized to sharpen the beveled cutting edge at a proper angle relative to the side edges of the blade portion.” Claim 1, col. 4 lines 64-67.

In the present invention, McCarty et al contemplate a reduced angle in conjunction with a cap of shaped polymeric material reinforced by fiber or mineral, and not the reduced angle by itself. No cap is mentioned in the Smith ‘355 technology which relates to chisel sharpening guides, and the reduced angle in conjunction with a fiber or mineral reinforced polymer is never mentioned in Jeffrey. The present inventors realized that they could select a cap made of shaped polymeric material reinforced by fiber or mineral and combine it with a sharper angled chisel and achieve impact effectiveness while achieving sound, vibration and safety characteristics.

Specific response to Detailed Action

Response to “Election/Restrictions”

The office action references that certain claims (152, 153, and 159-175) are deemed withdrawn because they are “drawn to a non-elected species, there being no allowable generic or linking claim.” The applicants believe that if claim 151 is allowed on which claim 152 and 153 depend, then these would be allowable dependent claims. Similarly, claims 159-163 are multiple dependent claims, and would be allowable if claims on which they depend, namely 143, 144, 145, 146, 147, 149, 151, or 152, are allowed. Claims 164-175 are withdrawn without prejudice to file a divisional application or other continuation.

Response to “Claim Rejections-35 USC §112”

The examiner's statement is acknowledged and correction has been made to claim 155.

Response to "Claim Rejections -35 U.S.C. §102"

This has been discussed in the "Discussion" above. Jeffrey '986 contemplates a soft, deforming material; this invention, with the claims now narrowed, contemplates the opposite. The Griffith paper, supra, shows that unreinforced nylon was tested and failed and will therefore not achieve the desired objectives of protection against spalling, vibration reduction and frequency shift. As described in the Griffith et al article, "testing [of the present invention] indicate a Minlon cap is capable of withstanding over 2000 dead-center impacts without failure, distortion, or wear." Griffith at p. 6, col. 2.

Also, Jeffrey has the high pitched "ping" of metal to metal contact when using Jeffrey's preferred mode of copper, and will have metal-to-metal contact upon failure of the soft nylon head which Griffith et al tested.

In the office action reference is made to " Claim 148: the shaped polymeric material being selected from the group of polymeric materials reinforced by fiber or mineral (see col. 1, line 57) and "Claim 155: a fiber-reinforced nylon (see col. 1, line 57)." See Office action 7/5/07 at 4. Jeffrey '386, col. 1, line 56 to 58 reads: "however, the material may be non-metallic such as resin, leather, rubber or the like or it may be a synthetic resinous material such as "nylon" and similar plastics materials all of which can be regarded..."

The word “reinforced” does not appear anywhere in Jeffrey, nor is there any reference to a particular reinforcement of mineral or fiber in that cited sentence having line 57.

As shown by the Griffith paper, the objective of deformation in Jeffrey will not occur using fiber-reinforced nylon.

In claim 150, the present invention references “no edge or surface is presented having a radius of curvature of less than .02 inches.” In Jeffrey ‘386, upon deformation, a sharp edge at the edge of the cap is presented, which as the Griffith et al article explains, will be destroyed on repeated impact. In this invention with reinforced polymer, the sharp edges are not presented, and the lack of sharp edges has the effect of reducing crack propagation and failure.

In sum, it is the combination of the present invention that yields the extended benefits of high force under the chisel, vibration reduction and frequency redistribution.

The dependent claims which are 144, 145, 147-150, and 152-163 are allowable if the independent claims are allowed.

Response to “Claim Rejections -35 U.S.C. §103”

Claims 145 and 149 were rejected in the Office action as being unpatentable over Jeffery in view of Smith.

As explained in the discussion, Jeffrey calls for a deforming soft material. In contrast to the present invention, Jeffrey’s technology presents the problem that energy is lost in the deforming of Jeffrey’s head (element 24) such that the cutting ability of a standard angle chisel is substantially diminished. For example, See Griffin article Figure

10 at p. 6, lowest curve (Capped, $\theta=65^\circ$). Also, as the material in Jeffrey deforms and ultimately fails as it mushrooms, the force transmitted into the chisel shaft to the chisel cutting edge begins to increase. That increase is such that a reduction in the standard chisel angle will cause the working end tip of the chisel to fail too quickly because too much force is applied to too sharp a tip once the cap has failed.

Smith deals with guides for sharpening and refers to a 65 degree standard angle. There is no suggestion that the standard angle be changed to cooperate with a reinforced polymer in Smith or in Jeffrey or in both patents, because Smith and Jeffrey merely suggest a soft deforming material with a standard angle having sharpening guides.

Claims 145 and 149, as now written, contemplate, as dependent claims, the combination of a non-deforming reinforced polymer in combination with a lesser angle of chisel to maintain prolonged cutting efficiency because of the reinforced polymer and the lesser-than-standard chisel angle.

Summary of Amendments to the Claims

Claims 1-122 are withdrawn. Applicant has retained the right to present the method claims set out in claims 118-122 in a divisional application, and preserves the right to present the unelected claims. New claims numbered 123-142 were presented in the prior office action. Claims 123-142 are withdrawn, though the right to present other species in a divisional application is reserved.

Claims 143-175 were presented as new claims in Applicants' preceding response to an office action.

In this Response, independent claims 143 and 151 have been narrowed to the amendment discussed in the examiner interview. Claim 146 already was narrowed to a fiber-reinforced polymer.

The dependent claims referring to the chisel angle have the words "less than" substituted for "decreased."

A redline of the changes to claims 143-175 is attached to this Response.

A clean copy of the claims with their status identifier is also attached as part of the Response.

A copy of the Griffin article presented at the examiner interview is submitted as an Exhibit.

Respectfully,

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I certify I caused the above to be filed electronically in the USPTO with its attachments this 19th November 2007.

_____/Brooke Schumm III/_____/s/ Brooke Schumm III